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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/701,658	11/30/2000	Carsten Bingel	732/980(26	5708

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WASHINGTON, DC 20036

EXAMINER

LEE, RIP A

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-7

Office Action Summary

Application No.

09/701,658

Applicant(s)

BINGEL, ET AL.

Examiner

Rip A. Lee

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-14 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This office action follows a response filed on June 5, 2002 in which claims 1-8 and 15 were canceled and claims 9-11 were amended.

Claim Objections

1. Claim 9 is objected to because of the following informalities: The claim does not appear to be self-consistent. If M is a group 3 metal, then integer m must be zero. If m is 1, the metallocene is rendered an anionic, "ate" complex. Such an embodiment lies outside the scope of the present invention. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

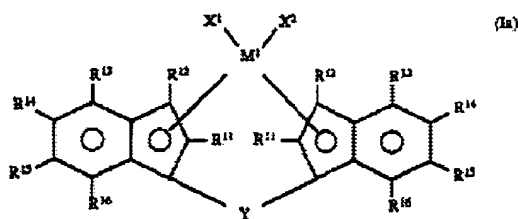
3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1713

4. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,795,838 to Tsutsui *et al.* for the same reasons set forth in the previous office action.

To recapitulate, claim 14 of Tsutsui *et al.* discloses transition metal complexes having formulae labeled as (Ia), (Ib), and (Ic). Example (Ia) is shown below.



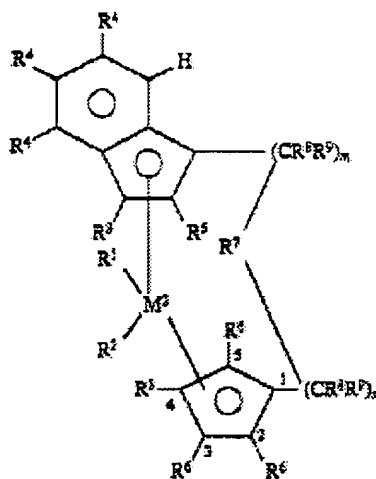
It is apparent that the compound contains the requisite bridged, *bis*(indenyl) ligand set. According to the claim, X¹ and X² may be the same or different from each other and are each a hydrocarbon group, an oxygen-containing group, a sulfur-containing group, a hydrogen atom, or a halogen atom. In structure (Ic), the ligand framework has been extended to benzo[*e*]indenyl ligands, and the term “oxygen-containing group” is elucidated. It is a C₆-C₁₀ aryloxy group (col. 58, line 40).

The reference does not show examples with compounds with X¹ as a halogen and X² as an oxygen-containing, aryloxy group. However, it would be obvious to one having ordinary skill in the art to derive such a compound because Tsutsui *et al.* clearly states that X¹ and X² may be different from each other, and because the reference adequately discloses use of both types of ligands. One would have expected such an embodiment to result in a useful catalyst precursor since it lies within the general disclosure of the prior art.

Art Unit: 1713

5. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,543,373 to Winter *et al.* for the same reasons set forth in the previous office action.

Briefly, Winter *et al.* teach metallocenes of formula (I), shown below.



The metal M^2 is a group 4 metal, R^1 and R^2 are identical or different and are a C_6 - C_{10} aryloxy group or a halogen atom, R^7 is $-M^1(R^{11})_2-$, in which M^1 is silicon and R^{11} is a C_1 - C_{20} alkyl group, and integer m is zero (claim 1). The reference does not show examples with compounds with R^1 as a halogen and R^2 as an oxygen-containing, aryloxy group. However, it would be obvious to one having ordinary skill in the art to derive such a compound because Winter *et al.* clearly states that R^1 and R^2 may be different from each other, and because the reference adequately discloses use of both types of ligands. One would have expected such an embodiment to result in a useful catalyst precursor since it lies within the general disclosure of the prior art.

Art Unit: 1713

6. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui *et al.* or Winter *et al.* in view of Repo *et al.* (*J. Organomet. Chem.*, 1977)

The discussion of the disclosures of the prior art of Tsutsui *et al.* and Winter *et al.* are incorporated here by reference. Both references disclose the use of a bridged, *bis*(indenyl) based metallocenes containing one C₆-C₁₀ aryloxy group, however, the references do not show examples of the aryloxy group. Repo *et al.* sheds light on the identity of said aryloxy group. The inventors teach the synthesis of monohalide zirconocene compounds containing 2,6-di-*t*-butylphenoxy and 2,6-diisopropylphenoxy ligands and their use as olefin polymerization catalyst components. Thus, one having ordinary skill in the art, having both references at hand, would have found it obvious to use the aryloxy groups disclosed in Repo *et al.* to make the compounds of the present claims, and one with ordinary skill in the art would have expected these compounds to be useful as catalyst precursors.

Response to Arguments

7. The Applicants traverse the rejection of claims 9 and 10 under 35 U.S.C. 112, second paragraph. It was not understood that the phrase in question was written as a proviso statement ensuring the presence of at least one indenyl ligand in the compound. The examiner thanks the Applicants for their explanation of this matter. Accordingly, the rejection has been withdrawn.

8. The Applicants traverse the rejection of claims 9 and 10 under 35 U.S.C. 102(b) as being anticipated by Schmidt *et al.*, the rejection of claims 9-12 as being anticipated by WO 98/56831 to Munck *et al.*, and the rejection of claims 9 and 10 as being anticipated by Dormand *et al.* These rejections have been withdrawn.

9. The Applicants traverse the rejection of claims 9-15 under 35 U.S.C. 103(a) as being unpatentable over EP 629,632 to Fukuoka *et al.*, the rejection of claims 9-15 as being unpatentable over Fukuoka *et al.* or Tsutsui *et al.* in view of Dormand *et al.*, the rejection of claims 11-15 as being unpatentable over Fukuoka *et al.* in view of Wochner *et al.*, and the rejection of claims 11-15 as being unpatentable over Fukuoka *et al.* in view of Barriola *et al.* These rejections have been withdrawn.

10. The Applicants traverse the rejection of claims 9-15 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,795,838 to Tsutsui *et al.* and the rejection of claims 9-15 as being unpatentable in view of Tsutsui *et al.* in view of Repo *et al.* The Applicant's arguments have been considered fully, but they are not persuasive. The following points were expressed:

(i) There is no suggestion to modify the compounds of Tsutsui *et al.* by selecting the specific bridged-indenyl metallocene monohalides claimed herein to obtain metallocenes having significantly better solubility in inert solvents.

The Applicants are correct in that there is no suggestion to modify the compounds of Tsutsui *et al.*, and that is because the inventors have already claimed bridged *bis*(indenyl) metallocenes in which X^1 and X^2 may be the same or different from each other and are each a hydrocarbon group, an oxygen-containing group, a sulfur-containing group, a hydrogen atom, or a halogen atom, with an example of the oxygen containing group being a C_6 - C_{10} aryloxy group. Thus, there is no need to modify compounds that already meet the claims of the present inventions.

That the monohalide complexes are significantly more soluble than their dichloride derivatives is not too terribly surprising. There are several well-established ways to improve solubility of a metallocene in an inert organic solvent. One involves modifying the compound itself. One would readily expect compounds containing aryloxy ligands substituted with hydrophilic, branched aliphatic groups to be more soluble in a hydrocarbon based solvent.

(ii) The deficiencies of the primary reference are not provided for by the ancillary reference, Repo *et al.* because the latter does not disclose bridged-indenyl metallocene monohalides.

If there are any "deficiencies" in Tsutsui *et al.*, they lie in the fact that "aryloxy group" is not adequately illustrated. However, one having ordinary skill in the art would comprehend the meaning of the term. Repo *et al.* was invoked merely to illustrate useful types of aryloxy ligand.

Art Unit: 1713

11. The Applicants traverse the rejection of claims 9-15 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,543,373 to Winter *et al.* and the rejection of claims 9-15 as being unpatentable over Winter *et al.* in view of Repo *et al.* The Applicant's arguments have been considered fully, but they are not persuasive. The following points were expressed:

(i) Winter *et al.* discloses a broad class of bridged *bis*-indenyl metallocenes bearing substituents in positions 2 and/or 4 of the indenyl moieties, wherein the transition metal may be variously substituted.

Metallocenes of Winter *et al.*, which bear substituents in positions 2 and/or 4 of the indenyl moieties, still satisfy the structural requirements recited in the present invention. In fact, according to present claim 11, the indenyl ligands are substituted by substituents R⁶, R⁷, and R⁹. Notably, R⁷ occupied the 2-position of the indenyl ring.

(ii) There is no suggestion that the instantly claimed compounds have a significantly higher solubility in inert organic solvents than the compounds disclosed in the prior art.

Solubility is not a claimed subject matter, and as explained previously, the increase in solubility upon change of the ligand sphere about the metal is an unexceptional result (*vide supra*).

In view of the discussion above, the rejection of record has not been withdrawn.

Art Unit: 1713

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (703)306-0094. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (703)308-2450. The fax phone number for the organization where this application or proceeding is assigned is (703)746-7064. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

ral

July 26, 2002


DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700